ORIENTHUNT: The Development of a scavenger hunt to meet the needs of a first year engineering orientation.

Samantha Gray
Curtin University, Perth, Australia
samantha.gray@student.curtin.edu.au

Euan Lindsay
Curtin University, Perth, Australia
e.lindsay@student.curtin.edu.au

Joel Walraven
Curtin University, Perth, Australia
joel.walraven@student.curtin.edu.au

Abstract: Orientation is an essential part of the transition into engineering studies. A successful orientation introduces students to their department and to university studies, providing important information and assisting the students in making friends and acclimatising to the university lifestyle. Scavenger Hunts have the potential to satisfy the objectives of university orientation, delivering information to students through the active learning environment of a campus-wide roaming team-based activity. Through the combination of team work, communication and information processing, the pitfalls of "traditional" orientation programs can be avoided. This paper describes the development and implementation of a Scavenger Hunt for First Year Engineering Orientation. The goals of traditional orientation programs will be discussed, with the challenges and flaws of these approaches identified. The development of the Scavenger Hunt is presented, highlighting how the items on the list map to the objectives of Orientation. The paper concludes with a reflection upon a trial implementation of the scavenger hunt with a subset of the first year engineering cohort.

Introduction

Orientation is an essential part of a student's transition into the university environment. Universities differ from high school and the workplace, and it is critical that new students develop an understanding of the expectations and cultural norms of their new university environment. Supporting this transition can be expensive in terms of time and resources; more efficient and effective mechanisms for orientation of new engineers are always being sought (Rossiter, Gray, Raina, Morley, & Desforges, 2008).

One approach to orientation is through the use of a scavenger hunt (Talton, et al., 2006). In a scavenger hunt participants are given a list of items to find within a given time limit. By carefully selecting these items to address the objectives of orientation, it is potentially possible to develop a scavenger hunt that meets the needs of new students, and supports their transition into engineering degree programs.

This paper will discuss the development and implementation of a scavenger hunt used in orientation for engineering first year students at Curtin University. This development process began with a review of the literature on orientation, and then progressed to interviews with First Year Engineering staff who reflected upon both the existing and the ideal orientation process. This allowed for the systematic identification of the objectives of the Curtin Orientation program.

Once the objectives are identified, items for the scavenger hunt list were developed to address each of these objectives, and a mapping process was performed to ensure that all objectives have been covered. The paper concludes with a preliminary evaluation of a pilot implementation of the scavenger hunt during orientation for the mid-year intake in 2011.

Future evaluation of the scavenger hunt will rely upon responses collected from the participants; Ethics approval for this work was given by the Curtin University Human Research Ethics Committee. The research was approved as low risk.

The Literature on Engineering Orientation

Orientation is a common theme in the literature on the first year in higher education; however there are a number of authors who have focussed specifically upon orientation programs in the engineering context. Three themes emerge from an analysis of their work: Integration and Familiarisation; Replacing the Old with the New, and Methods for Orientation.

Integration and Familiarisation

Universities operate very differently to schools, and students must familiarise themselves with the way that their university operates. Orientation is designed to 'introduce new students to the campus, each other, and key members of the department' (Talton, Peterson, Kamin, Israel, & Al-Muhtadi, 2006).

Effective integration can be achieved by 'familiarising the students with the university infrastructure, campus and academic departments. Additionally, to ensure the students have an understanding of the obligations, study habits, communication and to enable interactions with their department and peers' (Rossiter, Gray, Raina, Morley, & Desforges, 2008) Therefore the main theme of any orientation is to "increase the students knowledge of the institution and its traditions, to facilitate his or her integration into the institution's social and academic systems and to acquaint students with the administrative regulations and expected behaviours of the institution "(Pascarella, Terenzini, & Wolfle, 1986). Students who are happy within the new study environment are more likely to adopt the university ways and have a smooth transition into higher education.

Learning Areas: Replacing the old with the new

For an engineering student to learn, a learning environment must 'provide a sound approach to learning in which they can adapt to practises for undergraduate learning'(Rossiter, et al., 2008). This method has been undertaken using a 'Learning Trail' within 'Intro Week' to:

> *"Replace a number of didactic lectures giving student's basic information about the University, the department, their programme and so on. The change of learning environment enabled ' the students to find out the key information by themselves, by being active they were more likely to retain the most important information and also would be confident to find, independently, any important information they may need in the future."(Rossiter, et al., 2008).*

These are essential skills to increase a students' chance of success through their university career. Through removing the lecture style teaching, abstract concepts can be made more ' observable and touchable' and ' students would be able to better understand them and remember them'(Ji & Bell, 2000). This can be very valuable during orientation as much of the key information does not have a physical presence in the students' studies.

Methods for Orientation

The method of delivery of the orientation material can cause the students to be inattentive to the important details and key information. The students may not effectively transition into their new environment if key information has been missed or misunderstood. Traditional lecture based orientations may not engage all the students due to the diversity of the intake and cause students to miss information.

Students are often from different socio- economic groupings and come from different schooling backgrounds, which can cause inequality in the level of understanding of the students(Pascarella, et al., 1986; Rossiter, et al., 2008). The didactic style of lectures traditionally delivered during orientation may become less feasible as language may prove to be a barrier to understanding. The University of Sheffield runs a 'Intro Week' programs for Systems Engineering students, (Rossiter, et al., 2008), focused on student integration into the academic and social environment. By utilizing an active format throughout the week, the students are more likely to respond positively and retain the information delivered. Therefore the key orientation information can be delivered to a wide range of students.

Students often have a negative or 'skewed' view towards the university transition and many 'students often expect that they will be given all of the information'(Rossiter, et al., 2008). These students typically have issues with adapting to self learning. University staff generally believe that students should learn to obtain all of the information independently. In many cases these conflicting opinions can cause the students to feel unassisted in their transition. Most staff believe that the current programs do not accurately meet the needs of the students(Rossiter, et al., 2008).

Scavenger Hunts have been used for orientation in the past. The University of Illinois uses a scavenger hunt to orient Computer Science students to the campus, introduce students to problem solving skills and to sections of the course content through 'a critical-thinking competition that requires students to travel across the campus in small groups, collaborating to solve puzzles in order to progress from destination to destination' (Talton, et al., 2006).

Staff Reflections on Orientation

Orientation for first year engineering students at Curtin University has historically been a one-day event that features a range of lectures from academics throughout the day, and a group-based activity in the late afternoon. Overall responsibility for Orientation lies with the Director of the Engineering First Year department, who was interviewed to gather his reflections upon the goals of orientation, and the effectiveness of the current approach. The director explicitly identified two objectives for orientation: to provide key information and to prepare the students for their first day at university. Throughout the interview, however, it became clear that there was also an important social goal to the orientation process:

> *"due to the large volume of students and the way each person learns, every student will all retain different amounts of information. Therefore within their class groups, they might have all the information. Therefore one of the important things taught by orientation is co-dependence and the formation of group support network"*

Reflecting upon the implementation of orientation identified that while the current approach seems to work, there is definite room for improvement. The Engineering Foundation Year staff deal with a disproportionately larger number of questions from students who did not attend orientation than from those who did, which suggests that the current orientation is indeed working to some extent; however there were key areas that required attention.

The biggest challenge is what students have reported as "information overload". There is a large body of knowledge that first year students need to become aware of, and it is extremely difficult to effectively convey this information in a single day. Issues with the attention spans of students as well as the large number of students in the incoming cohort make it difficult to ensure that everyone is able to engage with all of the material throughout the day.

Students' assumptions about prior knowledge were a problem. Students have study habits they developed in high school, and there is a misconception that these study habits have prepared them for university. As a result many students do not engage with some of the material that is presented to them, because they feel that they already have a strong mastery of the concepts being presented.

The staff identified that orientation was significant for the 'development of friendships and relationships that will aid in their transition into university'. As the first occasion for peer interaction is within the student orientation, emphasis should be placed on an activity where this is a priority.

Students who make friends are more likely to feel comfortable in their new environment ensuring an easier transition to higher education.

This awareness of the problems with the current implementation meant that the EFY staff were willing to consider a shift to a more active learning based approach, rather than the current delivery-based approach – provided that there was a scholarly basis for the new implementation.

The Objectives of Orientation

By combining the literature and the staff reflections, a prioritised list of objectives for orientation was developed. This list included over 50 different objectives that orientation was intended to achieve; however not all of these outcomes were equally valuable. The five most important goals of orientation were identified as:

1. Provide a supportive transition into tertiary education- the support of a students' transition into university is vital for establishing the foundations of university study habits and an effective work-study balance.
2. Provide key information- the things that students must know about their new institution
3. Provide a group experience- a group experience allows students to develop much needed 'engineering skills' including team work, communication, time management and
4. Prepare students for their first day at university.
5. Assist students in making friends.

A scavenger hunt is able to address each of these objectives. Two of these objectives – group experience and making friends – can be inherently covered by making the scavenger hunt a team activity. The remaining objectives must be addressed through a careful selection of items for the scavenger hunt list.

Scavenger Hunt Development

The key to the successful development of a scavenger hunt as an orientation is the development of the scavenger hunt search items. The final list of items must address the objectives of orientation, as well as providing a stimulating and engaging activity for the students to participate in. In order to ensure the suitability of the final list, a comprehensive question pool was developed, and the only the best twenty items chosen for the final scavenger hunt. The question pool was generated through a range of approaches, each of which contributed to the overall pool. The initial question pool was developed through a brainstorm around the question "what should students learn in orientation?" This provided a substantial base for the question pool, with items such as 'What is the name and the room number of the large lecture theatre in the Nursing Building?' The question pool was then expanded to include items related to the identified deficiencies of the existing orientation program.

The final step in populating the question pool was to explicitly consider the five key objectives, and to identify items that would specifically address each of these objectives. For instance, it is not enough to simply assume that because the scavenger hunt is completed in teams that the students will have a positive group experience, or make friends; instead it is necessary to seed the scavenger hunt list with items that specifically encourage such behaviour.

Once the full question pool had been developed, a matrix was used to map each of the items to the five key objectives (FIGURE 1). Items that did not map to any of the objectives were discarded; items that mapped to multiple objectives were highlighted and prioritised for inclusion in the final list.

The final list contained twenty items; these were initially chosen as the four items that best addressed each of the five objectives, and then modified for the sake of overall balance of the list. Each of the items was reviewed to ensure that the wording did not already assume some familiarity with Curtin University; items with such assumptions were reworded.

Item	Orientation Objectives				
	Supports Transition	Provides Key information	Provides a group experience	First Day Preparation	Assists with making friends
Academic					
What are the opening and closing hours of the assignments office (in 24hr time)?	✓	✓		✓	
Environment					
What is the name of the cafe outside of Elizabeth Jolley lecture theatre?	✓	✓		✓	
Campus Information					
Engineering and Science Student Services can assist with enrolments or changing courses. What building (name/ number) is it located in??	✓	✓			
Key Information					
Write down the minimum personal protection equipment (PPE) required for working in the Engineering Mechanics and Electrical Laboratories.	✓	✓		✓	
Group/friends					
What are the middle names of all your team members?	✓			✓	✓
Library					
What is the name of the book with the spine label Q 808.0662 WIN?	✓	✓			
Guild/Clubs					
How much does it cost for a one year guild membership?	✓	✓		✓	✓

Figure 1: Extract from the List Items Evaluation Matrix

The list below is a sample of the scavenger hunt items that were included in the OrientHunt list.

1. What are the opening and closing hours of the assignments office (in 24hr time)?
2. Engineering and Science Student Services can assist with enrolments or changing courses. What building (name/ number) is it located in?
3. Three languages not spoken by members of our team but spoken by other Engineering First Year Students are:
4. If I miss a laboratory, test or an examination, I must provide documentation to prove I am sick or was unable to attend. What's the difference between the documentation required for an official examination and the documents required for regular laboratories or tests?
5. Write down the minimum personal protection equipment (PPE) required for working in the Engineering Mechanics and Electrical Laboratories.

Having developed the item pool, the method of implementation was considered. The scavenger hunt is best implemented as a group activity to reinforce the orientation objectives. Good engineering education is built on good group work; therefore it needs to be represented as early as possible in the university experience. Group projects have shown to "facilitate the acquisition of personal and interpersonal skills such as team working, project management and leadership which are much prized by employers but which have not traditionally been part of the disciplinary knowledge"(Hermon & McCartan, 2008). Student have also shown to have 'higher achievement' and 'better interpersonal relationships with peers and instructors' when working in groups (Willey & Gardner, 2010). By assisting student interaction and increasing the 'group experience', students will be better equipped to face the challenges of university. Giving them a group experience also gives them an opportunity to make friends.

Implementation

The Orienthunt Scavenger Hunt was implemented for the 2011 mid-year intake, forming the key afternoon activity for the students. The scavenger hunt was jointly coordinated by the Engineering First Year department and the Engineering student club, who provided volunteers to assist with the running of the event.

A total of 95 students participated in the scavenger hunt, working in teams of four or five. Teams were given two hours to complete as many items as possible from the list. The volunteers positioned themselves around the campus to assist the students with any inquiries and to assist in team development. These volunteers also took photographs to recorded the event. Teams were encouraged to interact with the volunteers and each other to find the solutions to the items; at least one of the list items required interactions with another group.

Unexpectedly, most teams took less than the allocated two hours to complete all twenty items. Two key factors contributed to this faster-than-anticipated completion: internal transfer students, and smartphones.

A significant proportion of the 95 students participating in the OrientHunt were internal transfer students from other degrees at Curtin University. For these students, at least three of the five key objectives have already been achieved – they have already had their first day at university, they have already transitioned into tertiary education, and they are already familiar with Curtin University. As such they already knew much of the information that they were required to find. While there are always a minority of these transfer students in the mid-year intake, the 2011 mid-year intake had a much higher than expected number of transfer students.

Many of the participants took advantage of their smartphones to seek the required information via the internet. For some of the items this was appropriate and anticipated – operating the library catalogue, or accessing the university plagiarism policy are activities that students would normally use the web to perform. Smartphones reduced the time required for the items intended to orient the students to the physical campus. Many of the first year lectures are held in a theatre in the Nursing building on the other side of campus. It was intended that the students would physically walk to this theatre to discover its name, and in doing so familiarise themselves with how to get there. Smartphones allowed them instead to look up the name of the theatre without needed to spend the time walking. The items will be carefully reworded in future to ensure they are smartphone-"proof".

Overall, the scavenger hunt proved to be successful. The students were able to complete the hunt and from the general consensus, felt more engaged. Students commented that they enjoyed being able to 'meet new people' and 'work in teams'. Most importantly, most students reported that they felt they would be able to find information for themselves when they needed it in the future.

Conclusion

Orientation is essential to provide key information to students about university and to aid their transition. Scavenger hunts can be effectively developed to meet the objectives of orientation including providing key information, preparing the students for their first day, providing a group experience and assisting the students to make friends.

The scavenger hunt reported in this paper was developed from an analysis of the orientation objectives drawn from the literature, as well as from staff and student comments. By targeting items upon the list to each of the key identified goals, an active, group-based orientation activity was provided to the students. Anecdotal feedback from the students was that the experience was positive, and that the intended goals of the event were actually met. Some unanticipated difficulties with implementation were identified, and these will be addressed in future work.

References

Hermon, P., & McCartan, C. (2008). *The Use of learning Styles as a guide for project group formation and methods of assesment.* Paper presented at the Engineering Education Conference.

Ji, T., & Bell, A. (2000, 26-28 April 2000). *Seeing and Touching Concepts in Class Teaching.* Paper presented at the Civil Engineering Education in the 21st Century Conference, Southampton, UK.

Pascarella, E. T., Terenzini, P. T., & Wolfle, L. M. (1986). Orientation to College and Freshman Year Persistence/Withdrawal Decisions. *The Journal of Higher Education, 57*(2), 155-175.

Rossiter, A., Gray, L., Raina, A., Morley, M., & Desforges, L. (2008). *Making the Most of Intro Week*. Paper presented at the Engineering Education Conference.

Talton, J. O., Peterson, D. L., Kamin, S., Israel, D., & Al-Muhtadi, J. (2006). Scavenger hunt: computer science retention through orientation. *SIGCSE Bull., 38*(1), 443-447.

Willey, K., & Gardner, A. (2010). *Collaborative peer Learning to change in culture and develop the skills for lifelong professional practise.* Paper presented at the Australasian Association For Engineering Education Conference, Sydney, Australia.